



Number Three

The Last of the Illinois:

The Origin of the Prairies:

By JOHN DEAN CATON, LL.D.



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F35

JUST ISSUED.

AN

HISTORICAL SKETCH

OF THE

EARLY MOVEMENT IN ILLINOIS FOR
THE LEGALIZATION OF SLAVERY,

READ AT THE ANNUAL MEETING OF THE

CHICAGO HISTORICAL SOCIETY,

DECEMBER 5TH, 1864,

BY

HON. WILLIAM H. BROWN,

Ex-President of the Society.

"Et Patribus et Posterati."

CHICAGO:
FERGUS PRINTING COMPANY,
244-3 ILLINOIS STREET,
1876.

LAST OF THE ILLINOIS

AND

A Sketch of the Pottawatomies.

READ BEFORE THE

CHICAGO HISTORICAL SOCIETY,

DECEMBER 13, 1870,

BY

JOHN DEAN CATON, LL.D.

CHICAGO:
FERGUS PRINTING COMPANY.
244-8 ILLINOIS STREET,
1876.

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ON the evening of December 13, 1870, the Honorable JOHN D. CATON, LL. D., late of the Supreme Court of Illinois, read before the Chicago Historical Society a paper entitled "The Last of the Illinois, and a Sketch of the Pottawatomies." Upon the conclusion of which, on motion of Mr. Arnold, seconded by Jas. L. Stark, Esq., it was unanimously—

Resolved, That the thanks of the Society are tendered to the Hon. John Dean Caton for the able and interesting paper he has read, and that he be requested to place the same among the archives of the Society and furnish a copy for publication.

THE LAST OF THE ILLINOIS.

Of the ancient civilizations we know but little. The beginnings of the Egyptians, the Etrurians, the Grecians, the Romans, and even the Milesians, are either entirely shrouded in the dark shadows of the far distant past, or are only lit up by the feeble rays afforded by uncertain fables or mythical traditions. Even far beyond these, great peoples lived, whose existence and civilization are testified to, by broken monuments and ruined architecture, widely scattered, especially over Arabia, and some parts of Africa, while in our own country and particularly in Yucatan, we see by their works that nations have lived of whom we know absolutely nothing as to whence they came or whither they have gone.

Geologists tell us of older peoples who occupied many portions of our globe, whose times they have divided into different ages, as the stone age, the bronze age, and the iron age, because of the materials which they used in their arts, but of their coming and their going they can tell us nothing, except that they existed one after another and ceased to be. Whence came the mound-builders of our own land, or those who worked the copper mines of Lake Superior, or those whose old inscriptions are found on the great stones of New Mexico, or when they disappeared, none can tell; they lived, made their record, and are gone, all else is as silent and as dark as the tomb that covers them. Yet, in all these records history is written, dim and shadowy though it be, still it is history, and we seize upon each sentence of it as upon a precious treasure, and we ponder it and strain our eyes to find more than it really tells, but the misty veil of antiquity hangs over it, and finally we turn away unsatisfied.

When America was first visited by Europeans, at least those who recorded what they saw, it was occupied by barbarous

tribes, some much more advanced than others, but still all were barbarians. Tradition, among the more advanced, pretended to tell how their ancestors had come from more northern climes, till finally they settled in the milder countries of Mexico or Peru, where they attained a sort of semi-civilization far in advance of the wilder nations, either to the north or south of them, but whether their ancestors were the mound-builders or the copper-workers, who once lived where we live, and were driven away by fierce northern hordes, more athletic than they, or peacefully left the land in search of a climate less rigorous, we can never know, nor can we satisfy ourselves of the degree of credence which we should place in their own traditions as told by their old men to the first Europeans who saw them, and by whom their stories have been handed down to us.

We do know, certainly, that when the Atlantic coast was first visited by white men, who have transmitted to us accounts of what they saw, they found here tribes of Indians who subsisted principally by fishing and the chase, although they practised agriculture to a limited extent, for they supplied the first immigrants to New England with corn from their hidden stores. The early explorers occasionally found the same grain cultivated in the valley of the Mississippi, and Lewis and Clarke procured supplies of it on the Upper Missouri. Still their agriculture was too limited to have had much influence on the density of population; and without the cultivated products of the soil no country can sustain a large population of men, if we except some tropical countries where spontaneous fruits are in perpetual season, and even there the aboriginal population was found to be very sparse as compared with countries where agriculture furnishes the principal sustenance to man.

From the changes which had recently taken place among the original inhabitants of this country, when they were first discovered, as told by their old men, and also from the changes which occurred after their discovery, but before the exterminating influence of civilization bore upon them, we may safely assume that national and even tribal formations had been quite recent, yet recent as they no doubt were, we know almost nothing of them. While we know that some nations became totally extinct by reason of aboriginal warfare alone, we cannot point to a single instance of the birth and growth of any native

tribe, unless the uniting of the remnants of several broken tribes into one, may be so considered.

At last we are forced back to the conclusion that it is only comparatively in modern times and of civilized communities that history, whether written in books or among the rocks, tells us of the origin of nations. To this we can mention one notable exception. By divine interposition, we are told of the beginning and of the progress, and by profane history of the final extinction of one of the great ancient nations of the earth. There we are told of its founder, Abraham, of its struggles, of its triumphs and its misfortunes, of its victories and its defeats, of its pure worship and its gross idolatry, and of its final extinction as a nation under the Roman Empire.

Necessarily, the history of the aborigines of this country is confined to the period since their first discovery by the educated man, and to the few uncertain traditions told by them of their comparatively very recent times, and most of these traditions as handed down to us are purely of a mythological character, and serve to teach us of the nature of the imagination or mental condition of the native rather than of actual facts that had gone before. Nor do those who have made the study of the native American a specialty seem to have given that study the form of connected history to any large degree, and he that would inform himself of such history must gather it from a thousand different sources, picking up a grain here and there, as he can find it.

More than thirty-seven years ago, when I first became a citizen of Chicago, I found this whole country occupied as the hunting grounds of the Pottawatomie Indians. I soon formed the acquaintance of many of their chiefs, and this acquaintance ripened into a cordial friendship. I found them really intelligent and possessed of much information resulting from their careful observation of natural objects. I traveled with them over the prairies, I hunted and I fished with them, I camped with them in the groves, I drank with them at the native springs, of which they were never at a loss to find one, and I partook of their hospitality around their camp fires.

Wild scenes have always had a charm for me. I have ever been a lover of nature, and the enjoyment of those scenes when prairie and woodland, lake shore and river were almost every-

where as nature made them, have left behind a pleasing memory which sometimes makes me almost wish that I could live over again my younger days. Since nature's handiwork has been defaced all around us by the hand of civilized man, I love to hie away to distant shores and the far-off mountains, and with a few friends of tastes similar to my own, enjoy the wild scenery among the rock-bound islands of Puget's Sound, or the still solitude of the high Sierras. Who would have thought, at the time of which I speak, that he who then here enjoyed the charms which nature throws over all her works, would ever seek the far-off scenes of the Pacific slopes in which to indulge his favorite reveries? There are some who hear me now, who remember the lake beach, with its conical sand-hills covered over by the evergreen juniper, whose fragrance loaded with a rich aroma the soft breeze as it quietly crept in from the rippling waters of the lake.

That old lake shore, fashioned as God had made it by his winds and waves for ten thousand years before, had more charms for me, than since the defacing hand of man has builded there broad avenues and great marble palaces, which are as far beneath the works of nature's Architect, as man himself is beneath Him who made all things well.

I thought that then a romantic place fit for the meeting of native lovers, in which to say soft words, and I felt assured that it was so thought by them when once I was called upon to unite in wedlock there a happy pair, whose ambition it was to conform to the white man's mode in that solemn rite, and, as the dusky bride explained, that it might last forever.

As might have been anticipated, neither history nor tradition pretends to go back to the origin of any of the native tribes who occupied this land when first explored by civilized man. At that time, the country where we live was principally occupied by the Illinois Indians, who were an important people, who ranged from the Wabash to the Mississippi, and from the Ohio even to Lake Superior, although there were a great many other tribes occupying the same territory. Their chief location was in Northern Illinois. Here was their home, and their great metropolis was where Utica now stands, in LaSalle county. There then stood the largest city ever built by northern natives. It was a delightful place, in the bosom of a beau-

tiful valley, and the city occupied all the intervening space between the river and the bluff, nearly a mile in extent. Their great cemeteries there testify to the populousness of the place, even were the testimony of the first discoverers wanting. If we do not know of the beginning of any native nation, we are credibly told of the extinction of this great people, and that, too, within a century after they were found so populous and so prosperous by the enterprising explorers.

Soon after their discovery by LaSalle, the great Iroquois confederation, whose battle fields were strewn with their victims almost from the Atlantic coast to the Wabash, and from the Great Lakes, and even north of them, to the Alleghanies and the Ohio, finally extended their enterprises to the Illinois. With a great slaughter they defeated this hitherto invincible people, laid waste their great city, and scattered them in broken bands over their wide domain. From this terrible blow they never recovered. For a century later they struggled with waning fortunes against northern encroachments, till finally they were exterminated by the Pottawatomies and the Ottawas, at Starved Rock, the Fort St. Louis of LaSalle, which overlooks the site of their great city and the scene of their first great defeat and slaughter by the conquering Iroquois, as I shall presently relate. There still stands this high isolated rock as it has stood for thousands of years gone by, the swift current of the river bathing its feet on one side, its summit overlooking the broad valley and the many wood-clad islands for many miles above and below it, fit monument to the great departed who had, during many long years of peace and security, looked upon its impregnable heights as a secure refuge in case of disaster. Alas! if it was secure against the approach of human hands, gaunt famine could scale its ascents and do its deadly work. There is, and ever will be, a charm about the place, both from its own romantic surroundings and the melancholy story of the bloody scenes it has looked down upon. While the visitor stands upon its native battlements, silently pondering what has been told him, insensibly his imagination carries him back to ages long ago, and he thinks he hears the wail of woe, oft and oftentimes repeated, and then again the song of revelry and joy sung by those departed long before the white

man saw it. The ancestors of my ancient friends were responsible for the last sad catastrophe.

The Pottawatomies were a tribe of the great Algonquin confederation, whose power was so severely felt by the British forces when at war with France, in the middle of the last century, though we do not know the story of their individual prowess in that sanguinary warfare.

When Fathers Allones and Doblon first visited Green Bay, and there established a mission, just two hundred years ago, they found the Pottawatomies established on those verdant shores, and this is the first mention I can find of them in history. That was then their settled home, though they roamed far away, for they were in the habit of extending their visits to the shores of Lake Superior. In 1671, they are mentioned as met with at LaPoint, on that Lake, by the missionary fathers, not as residents, but as visitors. At that time they were not known south of the lakes, for when Joliet and Marquette returned from their discovery of the Mississippi, by way of the Illinois river, in 1674, they met none of the Pottawatomies here.

In 1675, Marquette, no doubt by invitation of the Illinois Indians, whom he had met the year before on his return with LaSalle from the Mississippi, came from Green Bay to establish a Mission here. In this journey he was attended by a party of Illinois Indians, and also by a band of the Pottawatomies. So far as we know, these were the first of the tribe who ever saw the country south of Lake Michigan. They coasted the west side of the lake in open boats or canoes, in the latter part of the season, when the lake is boisterous and forbidding. It was a perilous and fatiguing voyage of four months' duration, and sorely tried the endurance of the zealous missionary. They at last reached Chicago, just as winter was closing in, and proceeded up the South Branch of the river to where Bridgeport now stands, and there built a hut, in which the missionary wintered. After the lonely and tedious winter was passed, he proceeded down the Illinois river to the great city of the Illinois, below Starved Rock, and there established the first Mission ever founded in the Illinois country, and named it Kaskaskia.

How soon after this the Pottawatomies left their old home on Green Bay, and sought more hospitable regions further south, we are not informed; nor can we tell whether the emigration was gradual, or if they broke up altogether, but as we find them in their southern homes in different bands, the probabilities are that they left in parties. A portion settled on the Saginaw Bay, in Michigan, who were subsequently known as the Pottawatomies of Saginaw, or of Huron. Others descended as far as Detroit, and settled in that neighborhood. Others found their way to the St. Joseph River, on the east side of Lake Michigan; and others, it may be presumed, came directly to Northern Illinois, though it is possible they spread from Michigan into Illinois. The precise date of these several migrations we cannot give, but Cragon and Bouquet found them, in the middle of the last century, occupying the country about Detroit and Fort St. Joseph; and we find no account of them within the last hundred years and more at Green Bay. From these explorers we get the first intimation of their numbers, and yet this is of the most unsatisfactory kind. They set them down at three hundred and fifty; and Dodge, a quarter of a century later, places them at four hundred and fifty, while Hutchins places them at a still lower number than the first. Upon these numbers we can place but little reliance; at best, it could have been but imperfect estimates, including no doubt only those bands whom they met at Fort St. Joseph and Detroit, without taking into account those at Saginaw or in Illinois. We may safely assume, also, that these figures are designed only to express the number of their warriors, for Sir William Johnson, who assembled the Algonquin confederation at Niagara, in 1763, informs us, that of the nineteen hundred and thirty warriors there assembled, four hundred and fifty were Pottawatomies, or, according to the old orthography, *Pontecanies*. With them and their associate warriors, General Bradstreet there concluded a treaty, which pacified all the Indian tribes bordering the upper lakes, who had hitherto been such inveterate enemies to the British Government and the English immigrant. A reasonably conciliatory course with them since, and a moderate share of good faith towards them, have enabled the Canadas to live with those who resided on the north shores, in amity in times of peace, and depend upon them as allies in

time of war. The number of warriors representing the Pottawatomies at the Algonquin convocation at Niagara, shows that the whole tribe must have been largely in excess of the numbers given by Bouquet and others, and their report so nearly approximates to the number of warriors at Niagara, as to convince us at once that they spoke only of their able-bodied men. Nor is it very probable that all the warriors which the several bands of that tribe could furnish, made the long journey to Niagara to attend the council. The fact that the Pottawatomies furnished nearly one-fourth of the representatives in that council of the whole Algonquin confederation, should convince us of the commanding importance of this tribe in that powerful association of the Indians, and so were they the last, south of the lakes, as we shall see, to yield up their place to the irresistible advance of civilization.

The fraternal relations existing between the Pottawatomies and the Ottawas, were of the most harmonious character. They lived together almost as one people, and were joint owners of their hunting grounds. Their relations were quite as intimate and friendly as among different bands of the same tribe. Nor were the Chippewas scarcely more strangers to the Pottawatomies and the Ottawas than the latter were to each other. They too claimed an interest in the lands occupied, to a certain extent by all jointly, so that all three tribes joined in the first treaty for the sale of their lands ever made to the United States.

Chicago was ever an important point in the estimation of the Pottawatomies and their associates, and here was the council held which resulted in that first treaty in 1821, when the three tribes named ceded to the United States five millions of acres in Michigan.

Since their emigration from the north, a sort of distinction had grown up among the different bands of the Pottawatomies, arising from their several locations, which seem to have stamped upon their tenants distinct characteristics. Those occupying the forest lands of Michigan and Indiana were called by themselves and by the traders the Indians of the Woods, while those who roamed these great grassy plains were called the Prairie Indians.

The former were much more susceptible to the influence of

civilization than the latter. They devoted themselves, in a very appreciable degree, to agriculture, and so supplemented the fruits of the chase very largely in their support. They welcomed the missionary among them with a warm cordiality. They listened to his teachings, and meekly submitted to his admonitions. They learned by heart the story of our crucified Redeemer, and with trembling voices recounted to each other the sufferings of the cross. They bent the knee and bowed the head reverently in prayer, and raised their melodious voices in sacred songs taught them by the holy fathers. They received the sprinklings with holy waters, and partook of the consecrated elements, believing devoutly in their saving grace. They went to the confessional with downcast looks, and with deep contrition told the story of their sins, and with a radiant joy received the absolution, which in their estimation blotted them out forever. Here indeed was a bright field of promise to those devoted missionaries, who deeply felt that to save one heathen soul from the awful doom, which they believed awaited all those who died without the bosom of the church, was a rich reward for a whole life of pinching privation and of severe suffering: and their great ambition was to gather as many redeemed souls as possible to their account, each of which should appear as a bright jewel in the crown which awaited them in that future state, to which we are all so rapidly hastening.

It was very different, however, with the Prairie Indians. They despised the cultivation of the soil as too mean even for their women and children, and deemed the captures of the chase as the only fit food for a valorous people. The corn which grew like grass from the earth which they trod beneath their feet, was not proper meat to feed their greatness. Nor did they open their ears to the lessons of love and religion tendered them by those who came among them and sought to do them good. If they tolerated their presence they did not receive them with the cordiality evinced by their more eastern brethren. If they listened to their sermons in respectful silence they did not receive the truths they taught with eager gladness. Even if they believed for the moment what they were told, it made no permanent impression on their thoughts and actions. If they understood something of the principles of the Christian relig-

ion which were told them, they listened to it as a sort of theory which might be well adapted to the white man's condition, but was not fitted for them, nor they for it. They enjoyed the wild roving life of the prairie, and in common with almost all other native Americans, were vain of their prowess and manhood, both in war and in the chase. They did not settle down for a great length of time in a given place, but roamed across the broad prairies, from one grove or belt of timber to another, either in single families or in small bands, packing their few effects, their children and infirm on their little Indian ponies. They always traveled in Indian file upon well beaten trails, connecting, by the most direct routes, prominent points and trading posts. These native highways served as guides to our early settlers, who followed them with as much confidence as we now do the roads laid out and worked by civilized man.

Northern Illinois was more particularly the possession of the Pottawatomies, but, as before stated, I have sought in vain for some satisfactory data to fix the time when they first settled here. They undoubtedly came in by degrees, and by degrees established themselves, encroaching at first upon the Illinois tribe, advancing more and more, sometimes by good-natured tolerance, and sometimes by actual violence. I have the means of approximating the time when they came into exclusive possession here. That occurred upon the total extinction of the Illinois, which must have been sometime between 1766 and 1770. Meachelle, the oldest Pottawatomie chief, when I became acquainted with them, thirty-seven years ago, associated his earliest recollection with their occupancy of the country. His recollection extended back to that great event in Indian history, the siege of Starved Rock, and the final extinction of the Illinois tribe of Indians, which left his people the sole possessors of the land. He was present at the siege and the final catastrophe, and, although a boy at the time, the terrible event made such an impression on his young mind, that it ever remained fresh and vivid. I am indebted to Mr. William Hickling for assisting my memory on a point so important.

The death of Pontiac, the great Ottawa chief, occurred in 1766. He was the idol of his own people, and was beloved and obeyed scarcely less by the Pottawatomies. They believed

that the Illinois Indians were at least accessory to his murder, and so held them responsible, and consequently the Ottawas and Pottawatomies united all their forces in an attack upon those whose deadly enemies they had now become. I am not satisfied that their previous relations had been those of cordial friendship, but if the peace had not been broken by open war there was that bad blood existing between them which must have arisen between those who were making and those who were suffering encroachments.

The Illinois Indians never fully recovered from the great calamity, which they had suffered a century before at the hands of the Iroquois. By that their spirit and their courage seemed broken, and they submitted to encroachments from the north, by their more enterprising neighbors, with an ill grace, no doubt, but without protecting their rights by force of arms, as they would have done in former times, and sought to revenge themselves upon those upon whom they looked as their actual enemies in an underhand and treacherous way.

In the war thus waged by the allies against the Illinois, the latter suffered disaster after disaster till the sole remnants of that once proud nation, whose name had been mentioned with respect from Lake Superior to the mouth of the Ohio, and from the Mississippi to the Wabash, now found sufficient space upon the half acre of ground which crowns the summit of Starved Rock. As its sides are perpendicular, except on the south where it may be ascended with difficulty by a sort of natural stairway, where some of the steps are a yard high and but a few inches wide, and not more than two can ascend abreast, ten men could repel ten thousand with the means of warfare then at their command. The allies made no attempt to take the fort by storm, but closely besieged it on every side. On the north or river side, the upper rock overhangs the water somewhat, and tradition tells us how the confederates placed themselves in canoes under the shelving rock and cut the thongs of the besieged when they lowered their vessels to obtain water from the river, and so reduced them by thirst, but Meachelle, so far as I know, never mentioned this as one of the means resorted to by the confederates to reduce their enemies, nor from an examination of the ground do I think this probable, but they depended upon a lack of provisions, which we

can readily appreciate must soon occur to a savage people, who rarely anticipate the future in storing up supplies. No improvident people could have subsisted long in such a place. How long they did hold out Meachelle did not, and probably could not, tell us; but at last the time came when the unfortunate remnant could hold out no longer. They awaited but a favorable opportunity to attempt their escape. This was at last afforded by a dark and stormy night, when, led by their few remaining warriors, all stole in profound silence down the steep and narrow declivity to be met by a solid wall of their enemies surrounding the point, where alone a sortie could be made, and which had been confidently expected. The horrid scene that ensued can be better imagined than described. No quarter was asked or given. For a time the howlings of the tempest were drowned by the yells of the combatants and the shrieks of the victims.

Desperation lends strength to even enfeebled arms, but no efforts of valor could resist the overwhelming numbers, actuated by the direst hate. The braves fell one by one, fighting like very fiends, and terribly did they revenge themselves upon their enemies. The few women and children, whom famine had left but enfeebled skeletons, fell easy victims to the war-clubs of the terrible savages, who deemed it as much a duty, and almost as great a glory, to slaughter the emaciated women and the helpless children as to strike down the men who were able to make resistance with arms in their hands. They were bent upon the utter extermination of their hated enemies, and most successfully did they bend their savage energies to the bloody task.

Soon the victims were stretched upon the sloping ground south and west of the impregnable rock, their bodies lying stark upon the sand which had been thrown up by the prairie winds. The wails of the feeble and the strong had ceased to fret the might winds, whose mournful sighs through the neighboring pines sounded like a requiem. Here was enacted the fitting finale to that work of death which had been commenced, scarcely a mile away, a century before by the still more savage and terrible Iroquois.

Still, all were not destroyed. Eleven of the most athletic warriors, in the darkness and confusion of the fight, broke

through the besieging lines. They had marked well from their high perch on the isolated rock, the little nook below, where their enemies had moored at least a part of their canoes, and to these they rushed with headlong speed, unnoticed by their foes. Into these they threw themselves, and hurried down the rapids below. They had been trained to the use of the paddle and the canoe, and knew well every intricacy of the channel, so that they could safely thread it, even in the dark and boisterous night. They knew their deadly enemies would soon be in their wake, and that there was no safe refuge for them short of St. Louis. They had no provisions to sustain their waning strength, and yet it was certain death to stop by the way. Their only hope was in pressing forward by night and by day, without a moment's pause, scarcely looking back, yet ever fearing that their pursuers would make their appearance around the point they had last left behind. It was truly a race for life. If they could reach St. Louis, they were safe; if overtaken, there was no hope. We must leave to the imagination the details of a race where the stake was so momentous to the contestants. As life is sweeter even than revenge, we may safely assume that the pursued were impelled to even greater exertions than the pursuers. Those who ran for life won the race. They reached St. Louis before their enemies came in sight, and told their appalling tale to the commandant of the fort, from whom they received assurances of protection, and were generously supplied with food, which their famished condition so much required. This had barely been done when their enemies arrived, and fiercely demanded their victims, that no drop of blood of their hated enemies might longer circulate in human veins. This was refused, when they retired with impotent threats of future vengeance, which they never had the means of executing.

After their enemies had gone, the Illinois, who never after even claimed that name, thanked their entertainers, and, full of sorrow which no words can express, slowly paddled their way across the river, to seek new friends among the tribes who then occupied the southern part of this State, and who would listen with sympathy to the sad tale they had to relate. They alone remained the broken remnant and last representatives of their once great nation. Their name, even, now must

be blotted out from among the names of the aboriginal tribes. Henceforth they must cease to be of the present, and could only be remembered as a part of the past. This is the last we know of the last of the Illinois. They were once a great and a prosperous people, as advanced and as humane as any of the aborigines around them; we do not know that a drop of their blood now animates a human being, but their name is perpetuated in this great State, of whose record of the past all of us feel so proud, and of whose future the hopes of us all are so sanguine.

Till the morning light revealed that the canoes were gone the confederates believed that their sanguinary work had been so thoroughly done that not a living soul remained. So soon as the escape was discovered, the pursuit was commenced, but as we have seen, without success. The pursuers returned disappointed and dejected that their enemies' scalps were not hanging from their belts. But surely blood enough had been spilled—vengeance should have been more than satisfied.

I have failed, no doubt, to properly render Meachelle's account of this sad drama, for I have been obliged to use my own language, without the inspiration awakened in him by the memory of the scene which served as his first baptism in blood. Who can wonder that it made a lasting impression on his youthful mind? Still, he was not fond of relating it, nor would he speak of it except to those who had acquired his confidence and intimacy. It is probably the only account to be had related by an eye-witness, and we may presume that it is the most authentic, and may well deserve preservation, and so may be worthy of a place in the archives of this Society, whose proper mission it is to gather up and bring to light whatever still remains to be gathered from the memories of those who are fast fading away, of scenes whose theatre was the land we live in, and of peoples who once occupied this territory. The few dim lights still remaining will soon be put out, and darkness and oblivion must shroud forever all that is then unrecorded.

This great event in Indian history secured to the Pottawatomies all the territory then belonging to the Illinois, and the exclusive right to which was undisputed by other tribes. It extended their possessions to the lands of the Peorias on Peoria

lake. They occupied to the Wabash as far south as Danville and even beyond. On the other side they occupied to the Rock river, though their right to a strip of land on the east side of that river was disputed by the Sac and Fox Indians who ranged the prairies west of there and beyond the Mississippi. They extended north into Wisconsin as far as Milwaukee, though their northern boundary was never well defined, but their friendly relations with the Chippewas prevented this from ever becoming a source of disagreement between them. After the extermination of the Illinois, their general condition was that of peace, and I have learned of few incidents since worthy of record. As before intimated, they had a perpetual difficulty with the Sacs and Foxes about the lands bordering on the east side of Rock river, and when the braves of the contestants met on the disputed territory they fought it out, but I have not learned that the war was often carried beyond the contested grounds, though the eastern boundary of these was quite undefined.

As a tribe, the Pettawatomies may not have taken an active part against the United States in the war of 1812, yet it is certain that many of their young chiefs and braves did so. On this subject they were extremely reticent. At one time, when riding over the prairie south of Blue Island, in 1833, with Billy Caldwell, when the old chief as usual was answering my questions about the past and what portion of the country he had visited, as it seemed inadvertently, he commenced giving an account of an expedition of the British from Canada across to Ohio, of which he and a number of his warriors formed a part, but he had hardly got them landed on our shores, when he seemed to remember that I was an American and that it was better not to enlighten me further on the subject, and he broke off suddenly, nor could I by any means prevail upon him to return to the subject.

During the Black Hawk war, as it was called, in 1832, as a people they remained loyal to the United States, but it was with great difficulty that many of the young men were kept from participating in the affray with the Sacs and Foxes. But the part they acted in that affair may be found in the written history of the times.

Chicago was ever a favorite resort of the Pottawatomies.

Here they chose to hold their great councils, and here they concluded the last treaty with our Government as they had the first, as I have already stated, twelve years before. This last treaty was made in 1833, and I was a daily attendant upon the deliberations of the council. By this time the Ottawas and the Pottawatomies had become so blended and intermixed that they had become practically one people, and were generally designated by the latter name. I do not remember the number of Indians in town at the time of the treaty, but the assemblage was by no means confined to the chiefs who participated in the deliberations. There were certainly several thousand natives here, who were supplied with regular rations of beef and flour by the Government, and it was manifest that they were quite willing to protract the conference so long as these should last.

At the close of each important deliberation, especially if much progress seemed to have been made, a keg of twisted plug tobacco was rolled into the council house, the staves cut in the middle with an ax, and the chiefs told to help themselves. This was accompanied with a box of white clay pipes. They helped themselves with great decorum, and even some ceremony.

By this last treaty, concluded at Chicago, in 1833, the Indians disposed of all their remaining lands to the United States, except some specific reservations to some of their chiefs, and agreed to remove to a limited location assigned them west of the Missouri river. When the treaty was finally concluded and the presents all distributed, and no more rations served out, they gradually dispersed till only those who resided in and about Chicago remained. For two years longer this people continued among us, subsisting as they had done before, nothing worthy of note, so far as I know, occurring in the meantime.

In 1835, and for the last time, the whole assembled at Chicago, to receive their annuity from the Government, and to make their final start for their new home. I was absent at the time of their assemblage, and have no means of stating at what date they began to make their appearance in the town, for now Chicago had really begun to present an appearance which would well justify the name. Here for the first time, many who had through their whole lives been in the habit of

visiting this favorite location, when the rank grass grew waist high where the Tremont and the Sherman houses now stand, must have been deeply impressed with the marks of civilization vastly more extensive than any they had ever seen before or been able to comprehend. It assured them, and they comprehended it, that they were already strangers in their native land. That a mightier race had come, so far their superior that they must fade away before it. It is emphatically true of all our American Indians, that they cannot exist, multiply, and prosper in the light of civilization. Here their physical vigor fails, their reproductive powers diminish, their spirit and their very vitality dwindle out, and no philanthropy, no kindness, no fostering care, of government, of societies, or of individuals, can save them from an inevitable doom. They are plainly the sick man of America; with careful nursing and the kindest care, we may prolong his stay among us for a few years, but he is sick of a disease which can never be cured except by isolating him from civilization, and remanding him to nature's wilderness, which in truth has more charms in many cases for even the white man, than the refinements and the restraints of the white man's mode of life. Our tastes for these are the results of artificial training, and our tendency is constantly to relapse to a wilder life in the woods and in the mountains. The bivouac of the soldier has a charm to which he often recurs with animated pleasure. The camp-fire of the hunter has a fascination which he who has enjoyed it can never forget. And in our earliest childhood we showed our natural tastes and inclinations by listening to stories of these, with more avidity than any other. Mayne Reid built his hopes on this juvenile taste, which he knew was stronger than any other, when he wrote his charming stories which have made his name so popular, yes, and so dear, too, to the rising generation. Accounts of huntings and fishings, of living in the woods and in the plains, or in some sweet little nook at the foot of the mountain, down which the babbling brook comes from the melted snows far above, and where nature in her unbroken beauty and her sublimity reigns around her supreme silence, and there is no mark and no sound of civilization near,—these have fascinations for even the white race as well, which are entirely wanting in the most glowing accounts of cathedrals, and palaces,

and pictures, descriptions of which fail to interest those whose tastes have not been cultivated up to their full appreciation. If a love of nature in her wildest moods and scenes be a relic of barbaric taste, which civilization has failed to eradicate, then to that extent, at least, I am a savage still.

This tendency in the white race to revert to what we may term the natural tastes, is strongly manifested, whenever we see one taken in infancy and brought up among savages. Almost always he is the greatest savage of them all, notwithstanding the hereditary influence through many generations of those cultivated tastes and habits which distinguish the civilized man from the savage. This observation may not be confined to the case cited, although that is perhaps the most convincing of this tendency to revert to the savage state. We often see cases where men have grown to maturity in the midst of civilized society, uniting themselves with the native tribes, and enjoying that life better than the former, and choosing to spend their days with their new found friends, although it involves a sacrifice of all those ties which so strongly bind us to friends and kindred and early associations. In such cases we rarely find them practicing those arts which they had early learned, or those habits of industry which is the distinguishing characteristic of civilized man. It is undoubtedly true, in these latter cases, that he who becomes a savage after puberty, has an exceptional inclination to revert to the wild state; still the number is so considerable as to show us that civilization has not been so long continued as to wholly change our natures, and that it is almost, if not entirely, artificial.

I think the facts will warrant the conclusion that this tendency to reversion is much stronger in the male than the female. In the few instances where the white female has been reared in savage life, and has then been reclaimed, she has more readily conformed to civilized habits, and has shown less longing for the wild scenes among which she was reared; and when she has been introduced to savage life after maturity, she seems always happy to escape it. In observing this fact, however, we ought not to forget that the harder lot of the female among savage peoples may tend to make her more willing to escape from what is really a state of bondage and servitude, than with the man, who is in every sense an equal, or, from

his higher intellectual endowments, may most likely occupy a superior position.

Reverse the state of things, and how rarely do we find the savage ever civilized. In the numerous instances where the savage infant has been removed from the influences and allurements of his ancestors, and reared entirely among us, and taught all that civilization and Christianity could teach him, but very few have been wholly weaned from the tastes and inclinations which they have inherited from their savage ancestors. Some notable and brilliant exceptions are no doubt to be met with, but they are so rare as to inspire rather our remark and admiration than a well grounded hope that we can ever succeed in reclaiming them as a people.

The native American is in some respects a proud and a sensitive being, and is not wanting in reflective powers. When brought in contact with civilization, he recognizes his inferiority, and appreciates his inability ever to overcome it. He feels that he cannot live with the stranger, except as an inferior, and, inspired by his native pride, he would rather cease to be than to do this. He appreciates his inevitable doom. He ceases to hope, and then comes despair, which contributes more than all else to hasten the result which he foresees. While all have seen from the beginning that the aborigines melt away and die out before the advance of civilization, in spite of the most humane efforts to produce a different result, we may not have appreciated all the causes which have contributed to this end. Those which have been the most readily understood, because the most patent, are the vices and diseases and poisonous drinks which the white race has introduced among them from the very first. If these were the only causes we might deem it possible, by municipal regulations, to remove them. While this would be a great boon which civilization undoubtedly owes to the original owners of the soil where we are so rapidly expanding into a great nation, I am satisfied it would not secure the great end which philanthropy must most ardently desire. Still they would not amalgamate with civilization, nor become civilized as a separate people. They can only live and prosper and multiply by continuing as their ancestors have lived, in a wild state, roaming over large areas sparsely populated, depending upon what they can secure of

nature's raising, and when their numbers become too great for subsistence upon such supplies, they must become reduced by wars, disease, or famine.

The views I have suggested, of the effect upon the mind and the sensibilities of the Indian, which is produced by his observations of advancing civilization as it intrudes upon him, and its reflected influence upon his physical organization, I think well illustrated and confirmed by the observations of Mr. Sproat in his "Scenes and Studies of Savage Life." He employed a large number of natives about his saw-mills at Barclay Sound, on Vancouver's Island. Here the natives were settled around him in comfortable dwellings with their families, and worked promiscuously with the white laborers. The strictest temperance was enforced throughout the settlement, and no violence was permitted toward the natives, but they were treated with the utmost kindness and fairness. They were well fed, well clothed, and carefully taught. Here they were surrounded with all the best influences of civilization, and as few of the vices as we may expect to find, when the red man is brought in contact with the white.

For a time, all seemed to go on well, and the experiment promised a success. At length, however, a change became observable, especially among the Indians who lived nearest the white settlements. A few of the sharpest of the young natives had become offensively European, as he calls it, but the mass of the Indians had ceased to visit the settlement in their free, easy, and independent way, but lived listlessly in their villages, brooding seemingly over heavy thoughts. They seemed to have acquired a distrust, nay, almost a disgust for themselves. At first they had looked upon mills and machinery, upon steamships and upon great houses, indeed upon all the wonderful works of the new comer, with curiosity and interest, but now, with distrust, with disgust, and even with despair; the effect of this despair was now manifest. They even began to abandon their old tribal habits, practices, and ceremonies. Presently, without any apparent cause, an unusual amount of sickness was observed among them, and the death-rate was largely increased, and so continued during the five years that our author remained among them. Nobody molested them.

Notwithstanding all their comforts and all the care bestowed upon them, they sunk into a gradual but sure decay.

The light of civilization instead of warming them into new life seemed to bring a blight upon them, they felt that they were an inferior race. They lacked the energy, and therefore the ability, to become and live as civilized men, and their proud hearts were crushed at the thoughts of living with the white race as inferiors and therefore a degraded race, and then necessarily followed disgust and despair, and then came disease and death.

Had they lacked that lofty pride and that love of independence which are so marked a characteristic of our Indians, they might have enjoyed the comforts which civilization brought them, without mortification at the consciousness of living as inferiors among a superior race. But no kindness, no assistance, no proffered recognition of equality, could hide from their view that they were and must be inferiors, while they could in contentment brook no superiors in fact.

In several cases advanced aboriginal Indian tribes, have by act of Congress been declared citizens and endowed with all the rights and privileges of citizenship. Still they were conscious of their inability to properly exercise and enjoy those rights and privileges. They knew they could not exercise the franchise side by side with the white man, with the same degree of intelligence and judgment, and so they scorned to use it. Perhaps it would have been better for them could they have ignored the real distinction which existed between them and the white race, and persuaded themselves, or been persuaded by others, that they were the equals of any. They had too much shrewdness to be thus blinded, and so they recognized a truth which another disposition would have concealed from them, and submitted to what seemed to be a fate in a sort of reckless, sullen silence, at least till a possible opportunity should occur for a striking blow, though it might be an expiring one, for what they believed existence; and if not for existence then for revenge—if not for the future then for the past.

Laying aside what all must recognize as palpable evils introduced among them, as fraud, whisky, and demoralization, there is, upon a deeper look beneath the surface, a fatal difficulty

which all the kindness and service which civilization, philanthropy, and Christianity can render them cannot overcome.

The proud and haughty chieftain clearly sees in the coming of the stranger, and in his proffered kindness, the unavoidable degradation of his people from that lofty estate of proud independence which his forefathers maintained, and that at last, after being driven from their envied inheritance, and finding no place of rest but in the grave itself, their final extinction from the face of the earth. It is a sad picture, and yet it stands out before us in the light of the past as if painted on the wall before us by the Divine finger. We may not deny that the sacrifice is necessary to promote the greatest good to the greatest number, but surely we may heave a sigh of sympathy for the victim whose immolation is necessary to carry out even a Divine plan. And so may we have some compassion for him if in his death-throes he manifests his savage and untamable nature. If it was his misfortune to be born a savage, with no rights which the white man is bound to respect, then it was his misfortune also to be born with a nature which renders him incapable of civilization, a lofty desire for independence, a profound detestation for everything like servitude, a deep-seated sentiment of revenge, and, above all, a total inability to appreciate how it is that he has no rights which he may call his own, and which even a superior race should regard.

We must admit that even our boasted civilization has its strange phases, and sometimes its manifest inconsistencies. We repeat the maxim that might makes right always with reproach, and yet act upon it whenever the public weal is supposed to require it. Perhaps the truest and the best justification which we can plead for insisting upon taking the lands of the aborigines whenever we wish them, using no more force than is necessary to accomplish what we deem necessary—whether the owner is willing to sell them or not—is that a few useless savages, who can do no good for the world at large, and little good even for themselves, must not stand in the way of the march of civilization; that God made the earth and all that is upon it for His own honor and glory, and that both they and we are but tenants at His will; and that it is His undoubted right, whenever in His good pleasure He sees fit, to eject those who in His estimation do Him no honor, and replace

them by those who may contribute more to His glory, and that thus He is working out His great scheme conceived from the beginning of all time. I say if we can but thus console ourselves that in what, to the superficial observer seems to be spoliations of the weak by the strong, we are but instruments in the hands of the Almighty to work out His great purposes and to execute His solemn decrees, then, indeed, we may feel that we have washed our hands in innocence. For myself, I have never been a very ardent believer in what is sometimes called special missions, and merely suggest this as the most plausible justification which I have ever been able to contrive. Still, I do believe that my old friends did not see it exactly in that light when they turned their backs upon Chicago, the scene of so many of their grave councils and of their happy gatherings—when they looked for the last time upon the ever bright waters of the lake, and bent their slow and reluctant steps to a land of which they knew not, and in which they would be strangers; and yet there were old men among them who could have told them that their fathers had with bloodier hands expelled another nation who had occupied the land before them, and that no doubt the title had been thus transferred many times, the conveyance always sealed by the blood of the last owner.

At this last gathering of the tribe at Chicago the total number of souls was about five thousand. While here they were well fed by the Government; and when they went they were removed by the Government under the charge of the late Capt. J. B. F. Russell. By him they were transported to their new home on a reservation assigned them by the Government in Clay county, Missouri, opposite Fort Leavenworth. Almost from the beginning a feeling of hostility was manifested toward them by the citizens of Missouri, which finally resulted, at the end of two years, in another removal by the Government, when they were located in Iowa, near Council Bluffs. Here, again, their home was of short duration, and they were removed a third time by the Government to their present location in Kansas, where they have remained for over thirty years. This reservation, however, they have now sold, and are about to remove for a fourth time within little more than a third of a century. Their new location is in the Indian country south

and west of Kansas. How long it will be before the pressure of advancing civilization will again push them on in search of a new home, we cannot certainly predict. We may safely say, however, that it cannot be very long. We may scarcely hope that they will ever find a quiet resting-place above the earth.

In their Kansas home, the Indians of the woods have continued to manifest their greater adaptability to conform to the habits of civilized life. They have there subsisted to a large extent by agriculture. Some progress has been made in teaching them in schools, and the influence of religion still exerts its sway over them, or at least their religious teachers still command their attention and respect. Out of seventeen hundred and fifty of which this band still consisted, according to the last report which I have seen, sixteen hundred are represented as subsisting by agriculture.

The prairie Indians yet remain as wild and untamable as ever. They are still averse to the labors of the field, and enjoy the life of indolence or else the excitement of the chase, by which and their annuities from the Government they eke out a scanty subsistence. The finger of fate seems to be pointed alike at the most civilized and the most savage. Final extinction is the end of the way down which all are swiftly rushing, and it would seem almost practicable to calculate with mathematical certainty, the day when they will live only in memory and in history.

They left Illinois thirty-five years ago with five thousand souls. At the date of the last report they had dwindled down to three thousand five hundred, and at this moment their numbers can scarcely exceed three thousand. From this each one may calculate for himself when the last day shall have passed —when there will be no living representative of that powerful people who but a century ago exterminated a nation at a single blow at Starved Rock. The last of the Pottawatomies will then have ceased to be.

I shall close this paper with an account of the great war dance which was performed by all the braves which could be mustered among the five thousand Indians here assembled. The number who joined in the dance was probably about eight

hundred. Although I cannot give the precise day, it must have occurred about the last of August, 1835. It was the last war dance ever performed by the natives on the ground where now stands this great city, though how many thousands had preceded it no one can tell. They appreciated that it was the last on their native soil—that it was a sort of funeral ceremony of old associations and memories, and nothing was omitted to lend to it all the grandeur and solemnity possible. Truly I thought it an impressive scene of which it is quite impossible to give an adequate idea by words alone.

They assembled at the council-house, near where the Lake House now stands,* on the north side of the river. All were entirely naked, except a strip of cloth around the loins. Their bodies were covered all over with a great variety of brilliant paints. On their faces, particularly, they seemed to have exhausted their art of hideous decoration. Foreheads, cheeks, and noses were covered with curved stripes of red or vermillion, which were edged with black points, and gave the appearance of a horrid grin over the entire countenance. The long, coarse, black hair was gathered into scalp-locks on the tops of their heads, and decorated with a profusion of hawk's and eagle's feathers, some strung together so as to extend down the back nearly to the ground. They were principally armed with tomahawks and war clubs. They were led by what answered for a band of music, which created what may be termed a discordant din of hideous noises produced by beating on hollow vessels and striking sticks and clubs together. They advanced, not with a regular march, but a continued dance. Their actual progress was quite slow. They proceeded up and along the bank of the river, on the north side, stopping in front of every house they passed, where they performed some extra exploits. They crossed the North Branch on the old bridge, which stood near where the railroad bridge now stands, and thence proceeded south along the west side to the bridge across the South Branch, which stood south of where Lake street bridge is now located, which was nearly in front and in full view from the parlor windows of the Sauganash Hotel. At that time, this was the rival hotel to the Tremont, and stood upon the same ground lately occupied by the great Republican wigwam where Mr.

* North-east corner of North Water and Rush Streets.

Lincoln was nominated for the presidency—80 feet south of the S.E. corner of Lake and Market streets. It was then a fashionable boarding-house, and quite a number of young married people had rooms there. The parlor was in the second story fronting west, from the windows of which the best view of the dance was to be obtained, and these were filled with ladies so soon as the dance commenced. From this point of view my own observations were principally made. Although the din and clatter had been heard for a considerable time, they did not come into view from this point of observation till they had proceeded so far west as to come on a line with the house, which was before they had reached the North Branch bridge. From that time on, they were in full view all the way to the South Branch bridge, which was nearly before us, the wild band, which was in front as they came upon the bridge, redoubling their blows to increase the noise, closely followed by the warriors, who had now wrought themselves into a perfect frenzy.

The morning was very warm, and the perspiration was pouring from them almost in streams. Their eyes were wild and bloodshot. Their countenances had assumed an expression of all the worst passions which can find a place in the breast of a savage—fierce anger, terrible hate, dire revenge, remorseless cruelty—all were expressed in their terrible features. Their muscles stood out in great hard knots, as if wrought to a tension which must burst them. Their tomahawks and clubs were thrown and brandished about in every direction, with the most terrible ferocity, and with a force and energy which could only result from the highest excitement, and with every step and every gesture, they uttered the most frightful yells, in every imaginable key and note, though generally the highest and shrillest possible. The dance, which was ever continued, consisted of leaps and spasmodic steps, now forward and now back or sideways, with the whole body distorted into every imaginable unnatural position, most generally stooping forward, with the head and face thrown up, the back arched down, first one foot thrown far forward and then withdrawn, and the other similarly thrust out, frequently squatting quite to the ground, and all with a movement almost as quick as lightning. Their weapons were brandished as if they would slay a thousand

enemies at every blow, while the yells and screams they uttered were broken up and multiplied and rendered all the more hideous by a rapid clapping of the mouth with the palm of the hand.

To see such an exhibition by a single individual would have been sufficient to excite a sense of fear in a person not over nervous. Eight hundred such, all under the influence of the strongest and wildest excitement, constituting a raging sea of dusky, painted, naked fiends, presented a spectacle absolutely appalling.

When the head of the column had reached the front of the hotel, leaping, dancing, gesticulating, and screaming, while they looked up at the windows with hell itself depicted on their faces, at the "chemokoman squaws" with which they were filled, and brandishing their weapons as if they were about to make a real attack in deadly earnest, the rear was still on the other side of the river, two hundred yards off; and all the intervening space, including the bridge and its approaches, was covered with this raging savagery glistening in the sun, reeking with streamy sweat, fairly frothing at the mouths as with unaffected rage, it seemed as if we had a picture of hell itself before us, and a carnival of the damned spirits their confined, whose pastimes we may suppose should present some such scenes as this.

At this stage of the spectacle, I was interested to observe the effect it had upon the different ladies who occupied the windows almost within reach of the war clubs in the hands of the excited savages just below them. Most of them had become accustomed to the sight of the naked savages during the several weeks they had occupied the town, and had even seen them in the dance before, for several minor dances had been previously performed, but this far excelled in the horrid anything which they had previously witnessed. Others, however, had but just arrived in town, and had never seen an Indian before the last few days, and knew nothing of our wild western Indians but what they had learned of their savage butcheries and tortures in legends and in histories. To those most familiar with them, the scenes seemed actually appalling, and but few stood it through and met the fierce glare of the savage eyes below them without shrinking. It was a place to try the

human nerves of even the stoniest, and all felt that one such sight was enough for a lifetime. The question forced itself on even those who had seen them most, what if they should, in their maddened frenzy, turn this sham warfare into a real attack? how easy it would be for them to massacre us all, and leave not a living soul to tell the story. Some such remark as this was often heard, and it was not strange if the cheeks of all paled at the thought of such a possibility. However, most of them stood it bravely, and saw the sight to the very end; but I think all felt relieved when the last had disappeared around the corner as they passed down Lake street, and only those horrid sounds which reached them told that the war dance was still progressing. They paused in their progress, for extra exploits, in front of Dr. John T. Temple's house, near the north-east corner of Lake and Franklin streets, then in front of the Exchange Coffee House, a little further east on Lake street; and then again in front of the Tremont, then situated on the north-west corner of Lake and Dearborn streets, where the appearance of the ladies in the windows again inspired them with new life and energy. From thence they passed down to Fort Dearborn, where they concluded their performance in the presence of the officers and soldiers of the garrison, where we will take a final leave of my old friends, with more good wishes for their future welfare than I really dare hope will be realized.

ORIGIN OF THE PRAIRIES

READ BEFORE THE

OTTAWA ACADEMY OF NATURAL SCIENCES,

DECEMBER 30TH, 1869.

BY

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ORIGIN OF THE PRAIRIES.

I PROPOSE to offer some observations on the Origin of the Prairies, though it may seem like presumption in me to attempt the discussion of a subject which that greatest of nature's students, the immortal Humboldt, seems studiously to have avoided. He describes to us all the prairies of the world, a great portion of which he had personally examined. He gives us their area, their geography, their topography, their surrounding, their components, and their products, but gives us no word of suggestion or explanation why they are destitute of trees, when surrounded and interspersed everywhere by forests. This, indeed, seems very remarkable in one who was, perhaps, the most extraordinary man that ever lived for observing, studying, and explaining every interesting phenomenon in nature. Why has not he, the most able of all men to discuss it, favored us with his views on this subject? We are hardly at liberty to suppose it was a mere oversight, and are loth to believe that he considered the inquiry of so little importance as to be unworthy of his notice. This would be too severe a reflection upon all those who have since considered the inquiry worthy of the most serious consideration. Since his time it has been the subject of much study and of many and conflicting theories. Although he, whom of all others we should listen to with the greatest interest, in answer to his inquiry, has, so far as I know, not chosen to enlighten us with his views, yet the origin of the Prairies is a theme which has commanded the attention of many, both of those whose eminent attainments entitle them to the appellation of learned, and those who dwell upon them but make no pretensions to such distinction. By the former, theories have been advanced, and elaborated, and

placed on record, some of which are quite inconsistent with others, so that all of them, at least, cannot be true; and probably we should not be very far out of the way should we conclude that some errors have crept into all, and also that none of them are entirely destitute of truth. Indeed, we are sometimes inclined to the belief that each one has written as if called upon to advance something entirely original, and this may have led some to the very borders of absurdity, and would almost induce the belief that their authors had never seen a prairie. Upon this, as upon all other subjects where we must depend upon evidence to lead us to correct conclusions, it is indispensable that we proceed upon *facts* and, so far as possible, *all* the facts which can enlighten our judgments upon the subject. The very moment we proceed upon assumed facts which in truth do not exist, then most likely the first step will be error, and so we shall be led by false lights to the very end, and it will be remarkable if our conclusions are not erroneous.

All men, and especially the learned, are, perhaps, too prone to theorizing, and such is the weakness of human nature that when a theory is once formed and announced, it is our child, our offspring, our fondling, and we seem to feel the obligation of a parent to ever after maintain and support it. Though, as it grows up, it may become deformed and ugly, and unworthy of our further care, it requires the stoicism of the Roman father to discard it and order its execution. All manner of violence is done to facts to win support and sustenance for the bantling, and every grain of proof in its defense is made to weigh a pound.

Each of the theories which have been advanced on this subject undoubtedly has some facts for its support, and possibly may account for the formation of some prairies; but neither is capable of accounting for all prairies. Hence I conclude that various causes have contributed to the formation of the prairies. It may be that some prairies have been formed by processes entirely different from processes which have formed others.

But, first of all, in the discussion of this subject, and so it is of all others, it is necessary to have a distinct understanding of the subject to be discussed. We must know precisely what particular facts are to be explained—what phenomena are to be accounted for. There are two distinct elements to be consid-

ered in the discussion of this subject. The one is the deposition of the soils and the configuration of the surfaces of the prairies; and the other is the absence of arborescent vegetation upon them, in what may be termed their natural state, while they are clothed with a rich coat of herbaceous vegetation. So it will be seen that I only propose to discuss what may be called the fertile prairies, laying entirely out of view those arid deserts formed in many portions of the globe where rains are so seldom that few varieties of the vegetable kingdom can exist without artificial irrigation.

My attention has been lately recalled to this subject by the re-persual of a paper prepared by Professor Leo Lesquereaux for the report of the Geological Survey of Illinois, and published in that Report, Vol. 1, page 238. Hence has it become the property of our State, and invites the criticism of all her citizens, thousands of whom have devoted much study to the subject, with better means of understanding it than is possible to one whose observations are confined to a mere superficial examination of them, as was evidently the case with the learned author of this paper, as I think I shall show before I conclude, although I attempt it with the greatest deference and respect for such high authority.

The theory of the learned Professor may be briefly stated thus: Prairies were originally formed in the shallow margins of agitated waters, either lakes or running streams. By the agitation of the waters of lakes drifting material is thrown up at a greater or less distance from the shores, forming dams or dykes, which serve to cut off shallow sections of water from the main body. These shallow ponds of water, being protected from the agitations of the main body, become the habitat of aquatic plants, which in successive crops decay and are reproduced, thus contributing to fill up the shallow pools, which end is also promoted by atmospheric deposits and the growth and decay of animal aquatic life, until finally the bottom of the pent up waters is raised above the surface, and a prairie is formed. The same process is repeated along the margins of rivers, where similar deposits are made in the still waters on either side of the active current, which cuts off sections of shallow water into quiet ponds along the river bottoms, which become filled up and are converted into prairies in the same

way. The paper says: "This peculiarity of formation explains, first, the peculiar nature of the soil of the prairies. It is neither peat nor humus, but a black, soft mould, impregnated with a large proportion of ulmic acid, produced by the slow decomposition, mostly under water, of aquatic plants, and thus partaking as much of the nature of peat as true humus. In all the depressions of the prairies, where water is permanent and unmixed with mineral matter, the ground is true peat. It is easy to understand why trees cannot grow on such kind of ground."

Now, the first criticism which the consideration of this theory invites is, that it assumes that all prairie soils are of the same character and constituents, and hence the conclusion that they are all formed in the same way and are alike unfitted to the growth of trees.

All familiar with the prairies, even the most superficial observers, know that this is not the case. There is almost, if not quite, as great a variety of prairie soils as of woodland soils. Scarcely one acre in the thousand of the great prairies of Illinois and Iowa would be recognized by this description. Peat bogs, as described by our author, are frequently met with, and sometimes bordering them the kind of soil he describes where ponds have been filled up and converted into marshes, and these, by a continuance of the same process, have finally become dry prairies; but a very large proportion of our dry prairies abound in true humus, while many are scantily furnished with vegetable matter. Such is the character of all our sandy prairies, a striking example of which is found near Pekin, in this State, stretching clear away to the banks of the Mackinaw, and even beyond it. Of the same character, also, are the prairies at Peoria, at Chillicothe, at Lacon, at Hennepin, and at Henry, and twenty others which I could name in Illinois. This soil is as permeable to the atmosphere, is as accessible to oxygen as any soil capable of sustaining vegetable life.

Surely these prairies are not treeless because the seeds of arborescent plants deposited on or in them are not accessible to the oxygen necessary to their development, which is, in fact, the only reason which the writer assigns for the absence of trees on the prairies. He says, immediately after my last quotation: "The germination of seeds of arborescent plants needs

the free access of oxygen for its developments, and the trees, especially in their youth, absorb by their roots a great amount of air, and demand a solid point of attachment to fix them selves. Moreover, the acid of this, by its particularly antiseptic properties, promotes the vegetation of a peculiar group of plants principally herbaceous." The truth is, all the vegetation found on the high prairies requires the accessibility of oxygen to its roots for its proper nutrition—nay, its vitality. Transfer the grasses on the rolling prairies into the swamps, or even the humid soil of the swales, and they will die as if burned with fire. The vegetation upon the prairies changes as they become dryer, no matter from what cause. Artificial draining produces this effect with appreciable rapidity. This, no doubt, is not entirely owing to the absence of stagnant water in the soil, but also to the absence of certain salts, which have been washed out by affording a passage to the water percolating through the soil. Although I cannot assert from actual analysis that this change takes place in the constituents of the soil by the process of draining, I think it is not a hazardous conjecture to suppose so, nor is it more unreasonable to suppose that the pores left vacant by draining off the water are directly filled by air, and so is the soil at once supplied with an abundance of oxygen necessary to the vitality of a new class of vegetation, which succeeds the old. The difference in the vegetation found on the different prairies, or on different parts of the same prairies, testifies to the different constituents in their soils. So soon as the soil is raised above the water, atmospheric air will penetrate it, more and more, in almost the exact ratio that it becomes dryer. Both mechanical and chemical changes are thence continually going on, and so are the constituents of the soil continually changing, and so does the character of the vegetation found upon them change, so that the soil will always be covered with some class of vegetation to which it is adapted. But it does not follow that all the kinds of vegetation which the soil is adapted to sustain, will be found there. Indeed, but a very few may be looked for. The selection of those that are found, and the exclusion of those absent, are determined by causes quite independent of the constituents of the soil. They are dependent upon accidental causes.

The theory under consideration also assumes that the subsoil

of the prairies is uniformly clay. A more intimate acquaintance with the prairies would have corrected this misapprehension. The super-soil of the prairies sometimes rests upon gravel and sometimes upon rock, and sometimes this gravel subsoil, at a greater or less depth, rests upon either a stratum of clay or upon rock. An example of the former may be found on the east side of the DuPage river, above Plainfield, in this State,—where we have the exceptional case of the entire absence of timber along the borders of a considerable river for many miles,—and in many places along the Fox river. Also, near Lisbon and at Joliet, we find the soil resting upon rock, with no clay interposed. Near Lisbon, particularly, this is found on the high, rolling prairie, far away from the river bottoms and from timber. I might cite many similar examples, but it is unnecessary. The vegetation covering all these, when not controlled by the humidity of the soil, is substantially the same, but neither the surface or the subsoil has in general anything to do with absence of arborescent vegetation.

That the prairies—that is, the land itself—have been formed under water, except the very limited portion of the surface which has been added from decomposed animal and vegetable matter since their emergence, will not be questioned by any one of the least observation; but that is not the main question involved in the present inquiry. Why are they not covered with forests? It is the cause of this feature which Prof. Lesquereaux undertakes to explain. His theory of the territorial formation is introduced solely for the purpose of explaining this phenomenon, and which it fails to explain, at least to my satisfaction.

If the Grand Prairie of Illinois was formed under water, from which it emerged by a slow process of elevation or by a subsidence of the waters, a theory to which I am prepared to assent, or if it was formed piecemeal by having one section of shallow water, and then another, cut off from the main body by the accumulation of deposits by the agitated waters, as described in the theory under consideration, then the lands now covered by the immense forests lying north and east of us, in Wisconsin, Michigan, Indiana, and Ohio, and of the same general altitude, were formed in the same way; and if this process of formation is the true cause why trees are not found

on our prairies, then the same cause should have produced the same effect there. But more, if this theory be correct, then the latest formations of land should be nearest the great bodies of water from which they have been detached, and less congenial to the growth of trees, and we should expect to find the forests most remote from the waters. Now, the very reverse of this is found, in fact, to be the case. At one single point alone does the Grand Prairie abut on Lake Michigan, and that for the short distance of four miles south of the mouth of the Chicago river. The great forests of Indiana are in the north part of that State, and we must go south of those forests to find her large and luxuriant prairies. In Northwestern Indiana we find those large swamps, which may have been cut off from the waters of the lakes in the manner supposed by Prof. Lesquereaux, and which are now in the process of being filled up; but it is a remarkable and interesting fact, that, wherever a point, no matter how small, in any of these great marshes has been raised above high water, it is covered with trees. No traveler can pass over the Pittsburg, Fort Wayne, and Chicago Railroad, for instance, without having his attention arrested by the innumerable islands, all covered with trees, rising everywhere out of this great marsh, all with surfaces but a very few feet above the water. If he has ever passed down the St. Lawrence, among the Thousand Islands, he is at once reminded of the fact by the similarity of the relative location, size, and number of the islands. I have in vain sought among these marshes for a dry place devoid of trees, except on the dykes themselves, portions of which may be found quite destitute of any vegetation, where the dry sand will afford sustenance to none.

That these marshes once formed a portion of the body of the lake, and have been cut off from it by dykes thrown up by agitated waters, may be true. Indeed, these dykes are as readily traced to-day as are the shores of the lake or the borders of the marshes themselves; but they are not uniformly overgrown with trees, as is supposed by the author of the theory under consideration. More than thirty-five years ago I examined one of the most remarkable of these ridges, south of where the village of Thornton now stands. It is composed principally of compact gravels, as straight as possible, nearly north and south; I should think, perhaps, three hundred feet

wide, and elevated, probably, ten feet above the marshes on each side. It is as regular in its grade as if thrown up by the hand of man, under the direction of a skillful engineer, and constitutes the most beautiful natural drive I ever saw, and, I understand, is now used as a public road. Not a tree was standing on it, nor the evidence that there had ever been one. The soil was light, but sufficient to sustain the pine or the black oak.

Although it is reasonable to suppose that this dyke cut off the waters to the west long before the waters to the east of it were separated from the lake by a similar process, yet the marsh on the west was not, and I venture to say is not now, elevated appreciably more than that on the east. This may serve to teach us how extremely slow is the filling up process of these marshes, even after they have been elevated so as to become passable to animals, and are annually covered with a heavy growth of grass—so slow, indeed, that it is inappreciable from one generation of men to another. I accept this as an evidence of the formation of some prairies in the manner supposed by our author, but not as a reason why they are destitute of trees. It seems to me that he does not sufficiently appreciate the effect of the chemical and mechanical action of the elements upon all things above the waters even in a short period, as reckoned by geological time, in which the life of man is so short as to be hardly an appreciable moment, and the entire historic period is scarcely long enough for a single breath. Although, geologically speaking, we can consider this a new country, yet time enough has elapsed since these high prairies were first elevated, or rather, I will say, were last elevated above the waters, to add to them something, at least, from animal and vegetable deposits and particles floating in the atmosphere, though slow indeed has been and will be this accumulation upon the surface, accelerated or retarded by human industry where civilization directs its energies.

Through the changes of accumulating ages, the soils of our prairies and woodlands have, no doubt, at different times, been adapted to the healthy growth of almost every variety of vegetation of the temperate zone, both herbaceous and arborescent, nor do I think it unreasonable to suppose that not only our present prairies, but the great forest land covering the

plains which spread away clear to the foot of the mountains east of us, may have been many times clothed with heavy forests, and these again denuded to naked prairies. It is a familiar fact, that places have been found covered with what appeared a primeval forest of hard wood, showing abundant remains of a growth of pine, which must once have occupied the same place. No fact is better settled in agricultural science, than that any particular crop of vegetation, if long continued, will in time exhaust the element necessary to its vigorous growth, when, if vegetation requiring a different element be substituted, it will grow with peculiar luxuriance. Hence the necessity for rotation of crops, which has been thus enforced by the laws of nature herself long before man appreciated its utility or adopted it in practice.

When the vegetation is not taken from the ground, but is allowed to return to it, the process of exhaustion is, no doubt, retarded to a certain extent, but is not entirely arrested, and hence we see this rotation of crops wrought out by the hand of nature itself, although at longer intervals than is required for the husbandman.

I entirely concur in the popular opinion, that among the most important of the causes which have produced this interesting result is fire, while the exhaustion and replenishing the soil with particular elements have, no doubt, had their influence.

The opinions of the first settlers on the prairies, who are often good observers of many phenomena, are entitled to respect, and, so far as I am aware, they universally attribute the absence of trees from the prairies to the periodical fires which swept over them, overlooking, no doubt, many minor causes. The hard, impenetrable character of the sward, formed by most of the herbaceous vegetation of the prairies, forms a serious impediment to the germination of seeds of trees, when, by accident, they fall upon it. It is not the composition of the soil that prevents the germination of this class of seeds, but whatever difficulty is experienced in this regard arises from the mechanical cause above suggested. The herbaceous vegetation which covers the prairies is furnished with an immense number of very strong roots,—far more so than any of the tame or cultivated grasses. In general, these form a complete mat

on the surface and penetrate to a great depth. They are often met with of a considerable size at a depth of six or eight feet. The extraordinary system of capillary roots with which they are furnished enables them to remain green and vigorous during the long droughts, which much more frequently occur on the prairies than in the timbered lands and in mountainous countries, during which the cultivated grasses, and even the clover, with its long tap-roots, greatly suffer. These long droughts, no doubt, also exert their influence to prevent the germination of arborescent seeds on the prairies, or to destroy the young plants, or, at least, to prepare them for certain destruction when the autumnal fires shall sweep over them.

It is a familiar fact to all careful observers that fire is much more destructive to the vitality of arborescent than to herbaceous plants. *ceteris paribus*. A fire that will destroy the last vestige of life in a tree of considerable size will leave the roots of the grasses surrounding it unharmed, from which will spring a more luxuriant growth the succeeding season. Indeed, it is a most interesting fact, familiar to all the early settlers who depended upon the prairie grasses for pasturage and for hay, that a much more luxuriant growth is produced on the prairies where the old grass is burned off than where it is allowed to remain and decay upon the ground. I have in person often made careful observations on this subject, and uniformly with the same result. The farmer does not burn off the old grass in the fall solely that it may not obstruct the scythe when mowing the next year's crop, but the most casual observation will show one that the actual growth of grass is, ordinarily, at least, one-third greater where the old grass has been burned off in the fall. I shall not stop now to explain why this is so, although I think it susceptible of a most satisfactory solution, but at present content myself with the fact that the roots of the prairie herbage are not injured by a very considerable degree of heat where even large trees would be liable to be destroyed. What, then, must be the fate of the tree of but a few months' growth? Utter annihilation seems absolutely inevitable. So long as the prairies are subject to the annual conflagrations, to which they are so much exposed in a state of nature, there is a manifest cause why trees get a lodgment on them with so much difficulty.

While I will make no question with Prof. Lesquereaux as to the process by which the marshes or swamps in the vicinity of some of our lakes and rivers have been formed, or the reasons why trees do not grow in them, conceding that perpetual stagnant water is destructive of arboraceous vitality, the error, I conceive, consists in carrying the proposition too far, and applying it where the existing conditions render it inapplicable,—in extending it from the marshes perpetually covered with water to the high, rolling prairies, where none of the conditions exist which prevent the growth of trees in the stagnant waters of the marshes. The cause of the absence of trees on the upland prairies is the problem most important to the agricultural interests of our State, and it is the inquiry which alone I propose to consider, but I cannot resist the remark that wherever we do find timber throughout this broad field of prairie, it is always in or near the humid portions of it,—as along the margins of streams, or upon or near the springy uplands. Many most luxuriant groves are found on the highest portions of the uplands, but always in the neighborhood of water. For a remarkable example, I may refer to that great chain of groves, extending from and including the Ausable Grove on the east and Holderman's Grove on the west, in Kendall county, occupying the high divide between the waters of the Illinois and the Fox rivers. In and around all the groves flowing springs abound, and some of them are separated by marshes, to the very borders of which the great trees approach, as if the forest were ready to seize upon each yard of ground as soon as it is elevated above the swamps. Indeed, all our groves seem to be located where water is so disposed as to protect them, to a great or less extent, from the prairie fire, although not so situated as to irrigate them. If the head waters of the streams on the prairies are most frequently without timber, so soon as they have attained sufficient volume to impede the progress of the fires, with very few exceptions, we find forests on their borders, becoming broader and more vigorous as the magnitude of the streams increase. It is manifest that land located on the borders of streams which the fire cannot pass are only exposed to one-half the fires to which they would be exposed but for such protection. This tends to show, at least, that if but one-half the fires that have occurred had been kindled, the arboraceous

growth could have withstood their destructive influences, and the whole surface of what is now prairie would be forest. Another confirmatory fact, patent to all observers, is, that the prevailing winds upon the prairies, especially in the autumn, are from the west, and these give direction to the prairie fires. Consequently, the lands on the westerly sides of the streams are the most exposed to the fires and, as might be expected, we find much the most timber on the easterly sides of the streams.

Another fact, always a subject of remark among the dwellers on the prairies, I regard as conclusive evidence that the prairie soils are peculiarly adapted to the growth of trees is, that wherever the fires have been kept from the groves by the settlers, they have rapidly encroached upon the prairies, unless closely depastured by the farmer's stock or prevented by cultivation. This fact I regard as established by careful observation of more than thirty-five years, during which I have been an interested witness of the settlement of this country,—from the time when a few log cabins, many miles apart, built in the borders of the groves, alone were met with, till now nearly the whole of the great prairies, in our State at least, are brought under cultivation by the industry of the husbandman. Indeed, this is a fact as well recognized by the settlers as that corn will grow upon the prairies when properly cultivated. Ten years ago I heard the observation made, by intelligent and observing men, that within the preceding twenty-five years the area of the timber in the prairie portions of the State had actually doubled by the spontaneous extension of the natural groves. However this may be, certain it is that the encroachments of the timber upon the prairies have been universal and rapid, wherever not impeded by fire or other physical causes, without regard to the constituents of the soil.

The manner and progress of the encroachments are familiar to all. The hazel is the usual pioneer in these encroachments, though sometimes even this is preceded by the wild apple. No one can at this day travel two hours on any of the railroads through our prairies without passing some grove of timber bordered by considerable belts of hazel, among which, not far from the outer edge, young forest trees will appear, and these will be observed larger and larger as they are farther and farther from the edge of the grass, and are found nearer and

nearer the original forest, and this where there has been no cultivation. This is the usual though not universal appearance of the surroundings of the groves at the present day. Sometimes, no doubt, large trees will be found as advance sentinels, standing out quite in the prairie, but how they have been able to maintain their ground there we may not at all times be able to explain. Such instances are rare exceptions. The general rule is, that the hazel is in the advance, and from this we may safely conclude that this shrub can maintain the struggle for life with the prairie grass better than forest trees, while in turn it succumbs to the latter. In the hazel rough the seeds of the trees find an accessible soil, where the young plants are indifferent to or are benefited by the shade. In time they rise above the hazel, and at length grow to sufficient size to constitute a forest, and shade the ground, which destroys the hazel, which was their protecting nurse in infancy. The facts stated, I think, clearly warrant the conclusion drawn.

In the paper under consideration, the author, in answer to some, I think, well-considered remarks of Prof. Winchell, says: "The second assertion, that *trees will grow on the prairies when introduced* or planted, is certainly true. But we should take care to make a distinction between the results of an artificial process and a natural one. When trees are planted on the prairie the soil is conveniently prepared. The clayey subsoil mixed with the black mould forms a compound which combines density of certain parts with lightness of others, and contains a great proportion of nutritive elements. If the clay of the subsoil is not too thick to be impermeable to water, and thus to retain it around the roots, this prepared or artificial ground is very appropriate to the growth of trees. But has ever anybody seen oaks or hickories, or any other kind of trees, grow in the prairies from a bushel of acorns or of nuts thrown upon their surface? Why, then, if trees will grow on the prairies, do we not see those isolated and far-between clusters of trees which appear here and there on the borders of ancient lakes cover a wider area and by and by invade the whole prairies? Some of those trees have lived there for ages, their trunks are strong and thick, and their branches, widely expanded, are shaken and their fruits swept away by the impetuosity of the autumnal storms; and, nevertheless, their domain

is restricted by the nature of the ground to limits which they have never surpassed."

Now, the observations already stated, and about which I cannot be mistaken, and in support of which thousands of witnesses who have dwelt upon the prairies for many years, and have been in the constant habit of observing the various phenomena which they present, can be met with everywhere in this prairie country, fully answer the suggestions contained in the full extract which I have made. Arboreous seeds, when thrown upon the unbroken prairie, do germinate and grow to trees, but with difficulty, no doubt, on account of the sward on which they fall, and the great danger to which they are exposed, especially from fires. Where they have no protection from these their destruction is almost certain, no matter how readily the seed may germinate or how vigorously the young plants may grow. It does not require the cultivation of the soil, the mixing of the clayey subsoil with the black mould of the surface, to insure the successful growth of trees upon the prairies. Indeed, I have already shown that not all the prairies have a clayey subsoil, and, as is elsewhere shown in the paper under consideration, in but few instances does the clay approach the surface to within the reach of the plow. The whole theory under consideration is based on the fatal error that the prairie soils are not adapted to the growth of trees. I do not speak from mere conjecture, but from carefully observed and well attested facts, when I say that the exact reverse is the case.

We have, then, obvious reasons why the scattered clusters of trees referred to, the isolated groves upon the prairies, have not extended their domain so as to embrace the whole field. The prairie fires, the matted, tough sward, the grazing of wild animals in the neighborhood of the groves to which they resorted, the aboriginal encampments usually located around the borders of the groves would seem to present sufficient explanation why the groves have not extended, independently of the quality of the soil. That the cultivation of the prairie soils improves their condition for the growth of trees is proved by the more vigorous growth of those where the ground is cultivated than those which spring from seeds accidentally scattered on the

prairie along the borders of the groves; but this is true of herbaceous vegetation as well.

Who that is intimately acquainted with and has carefully studied the prairies will dispute that the soil of the groves has been formed by the same process that has formed the soil of the treeless prairies? The theory that these groves mark out the places where the agitated waters have thrown up embankments, which cut off the shallow waters where the naked prairies have been formed, is not sustained by either the topography or the geography of the ground. If this theory were true, we should find the groves in continuous lines, upon elevated ridges, composed of sand and gravel, such as we uniformly find to comprise those dykes, which, undoubtedly, have been formed as supposed, and have performed the office assigned them. Such, however, is not the case. In very few instances do we find the groves occupying continuous, unbroken ridges of any considerable extent. We find them scattered over the prairies, without law or order, excepting only the condition of water in some form in their vicinity, which may serve to protect them from the conflagrations of the prairies. This water need not charge the soil itself with humidity in order to secure the growth of trees, for it is not uncommon to find the groves occupying the highest and driest knolls, but at their feet, or at least so near as to serve as a protection, water is sure to be found. In former times, when the traveler, in crossing the great, wild prairies, saw a grove in the distance, he shaped his course to it, with the absolute certainty of finding water there, no matter how dry or parched the prairie might be.

The soil, too, gives no evidence of an accumulation of material, such as is usually thrown up by agitated waters. When we penetrate the soil of the woodlands, even to great depths, as in digging wells, and the like, we find the same formations which are met with in the surrounding prairies. I have already alluded to the fact that whenever we find a chain of groves occupying the high divides of the water sheds of the prairies, they are generally separated by deep depressions, which would have destroyed them as dykes for the separation of the waters.

As I have already stated, I am prepared to admit, as almost a demonstrated fact, that not only our great prairies, but also our great forest lands and the desert plains, filling all the space

between the Alleghenies and the Rocky Mountains, were originally formed or deposited under water, from which they have emerged by some process of nature, probably very slow; but this elevation has not been dependent, to any considerable degree, upon additional deposits, but upon the actual upheaval of the mass of matter originally submerged, or the subsidence of the waters by the removal of barriers which once restrained them. And yet, if all prairies have been formed as supposed by the theory which I have taken the liberty of criticising, they have been formed by deposits in the water till, by successive accumulations, they have finally emerged above the waters.

To me the evidence that this is not so is absolutely conclusive, as well as that the deposits have been very insignificant, since they were deeply buried under the waters. I will state some of the facts, within the observation of all men, which have led me to this conclusion.

I think it is universally accepted, at least among scientific men, that the rocks (called boulders) scattererd over most of our prairies, at least east of the Missouri river and north of latitude forty, have been transported from their original beds in the north to their present places by means of floating ice. Apart from the admitted fact that this is not their native place, or that they did not grow here, and hence must have been transported by some agency, and of our absolute inability to conceive of any other capable of producing such results, many of the masses, espeecially in the Iowa prairies, weighing hundreds of tons each, and the additional fact that their rounded form has been acquired by abrasion, by which their sharp angles have been worn away since they were detached from their original beds, and we can conceive of no other adequate agency to produce this result but moving water and ice,—I say, aside from all this evidence, within two miles of where I now write, the most eonvining evidence exists that these boulders were brought by icebergs. To the north, but more especially to the west, of the city of Ottawa, and almost within its limits, it is easy to trace the exact size and form of the masses of ice, where they grounded and deposited their freight of boulders. There one may walk over a quarter of an acre, a half an acre, or several acres, according to the size of the mass, always stepping on these stones, thus deposited close together as they were when

embraced by the congealing waters, and outside of the borders not a single stone can be found till another similar collection is met with. The borders of these collections are as sharply defined as if marked with a wall. Here, too, another interesting fact may be observed, which shows that they were not transported in one voyage from their original homes to their present resting place. We observe a single collection composed of a great variety of rocks—several kinds of granite, trap gneis, sienite, and perhaps a dozen others, which we know, from their far distant beds, had been drifted or rolled together from long distances, and worn to their present form, before they were picked up for their last voyage.

The rock-bound shores of Lake Superior show us how these boulders were formed. There, in many places, we may see before us the lately-detached blocks of rock, with all their angles sharp, and, as we pass down from the top of the cliff over the broken masses to the very edge of the water, and even look beneath it, we find the angles of the blocks more and more worn, and the masses themselves smaller, till at last, when we reach the water and look into it, we see before us the smooth, rounded boulders, as we see them on our prairies; and if we will stand there when a heavy sea is rolling in, we shall see the great blocks of stone jostled together and the process of abrasion going on before our eyes. It may take a thousand great storms to wear away an ounce from a single block, yet enough millions of such storms will at least do the work, and that effectually. Perhaps the most accessible point where this manufacturing of boulders can be witnessed is on the mainland west of Partridge Island, a few miles above Marquette. I cannot forbear to mention one other interesting evidence of the transportation of these boulders. A few miles south of Waterloo, in Black Hawk county, Iowa, is the fragment of an immense boulder, which must weigh many hundred tons, showing on one side a distant face of a comparatively recent fracture, and I was credibly informed that many miles distant a similar fragment existed, with a face the counterpart of this, showing that at one time both had constituted one mass.

Now, assuming that our prairie boulders were transported by icebergs to their present places, and that we are, in some cases at least, enabled to determine the minimum sizes of the bergs

which brought them, we are forced to the conclusion that the prairies were covered by deep waters at the time of their transportation. We may safely assume that ancient bergs resembled those now seen floating from the frigid zones into lower latitudes, where they often ground and are melted away, depositing whatever heavy material they have brought with them from their starting point, which we are told by arctic navigators is always at or near the shore. If this be so, we know they must have required a great depth of water to float them. Bergs are now frequently met with projecting hundreds of feet above the water; and, as they float with at least five sixths of the mass under water, we may form an approximate idea of the depth of the water here when these boulders were deposited. At least, we may assume that is was very considerable. Had there been any considerable deposit after these boulders were dropped where we now see them, while they were being elevated above the waters, they must have been deeply buried beneath this deposit, and we should not have this clear evidence, at least, of the former submergence and of the very insignificant deposition during the process of elevation from beneath the waters.

I claim no originality in these suggestions. I have only stated what I believe to be the accepted theory by the most observing and reflecting men in accounting for the presence of the prairie boulders; but what I claim is, that the patent facts stated are inconsistent with the theory that the great body of our prairies have been built up by accumulations and deposits in shallow water till they were raised above it, and then finally till they have attained their present altitudes. I say the boulders alone absolutely forbid this, unless they, too, were deposited in very shallow water, or in most cases long after the emergence. But few facts have ever been established by circumstantial evidence more conclusively than this.

But even admitting the shallow pond theory as fully established, and clearly showing how all the soil of the prairies has been formed, and it by no means affords as satisfactory a solution of the problem presented by the absence of trees upon the prairies as I have attempted to show in a previous portion of this paper.

Indeed, we venture upon very much whenever we assume to explain all the laws by which nature works out her great

results, or to state all the causes which may have tended to produce this one result. One cause or set of causes, if I may use the expression, may have produced it in another place. While we may have clear proofs of the existence and operation of some of these causes, we may not deny that others, and many of them, have been operating for ages since the prairies became dry land, first to promote the growth of one kind of vegetation which by other causes has been destroyed and replaced by another, and, for aught we know, this process may have been many times repeated. In contemplating these works of nature we are too apt to confine our reflections to yesterday. When we pause, and let the mind run back through the vista of time till it becomes bewildered and lost in the contemplation of distance without end, we are then prepared, when we return to complete consciousness, to appreciate that the growth of the oldest tree of the forest, when considered in relation to past time, has been as rapid as is that of the eastern magician, who plants the seed of the orange before your eyes, and while you yet look the tender plant springs from the ground and grows up to a full sized tree, bears blossoms, which fade and fall, and the green fruit appears in their places, which immediately grows to its full size, matures and ripens, and you are invited to pluck and eat, and you find in your hands a veritable orange, rich, juicy, and nourishing. I say this is but the history of our oldest forest trees, when contemplated with reference to the ages that must have elapsed since this land emerged from the bosom of the waters. During all these rolling years surely there has been time enough for the prairies to have been clothed with forests, and again denuded of their trees, and for the process to have been many times repeated, by agencies not beyond our comprehension of nature's laws. But because this may have been, I have no warrant for saying that it has been, for the want of tangible proof of the fact. I may even assert its probability, or my belief that it has been so, but at last it is but conjecture, and as such alone may be suggested. Still we cannot shut our eyes to the fact that the study of the geology of this country, in some of its departments at least, is yet in its earliest infancy. May we not reasonably hope that its maturity will develop facts which will dispel the obscurity which now veils many subjects of most interesting inquiry,

and enable us to read the past in a clear and convincing light? For instance, the prairies abound in beds of peat, of greater or less extent, some of vast proportions. As yet these are comparatively sealed volumes of history, which, when they shall be opened and read, as they have been in what we call the older countries of the world, will reveal the record of bygone ages. What treasures of truths have been revealed by the examinations of the peat-beds of Denmark, to which reference may be made as quite appropriate to the present inquiry! These are of depths varying only from ten to thirty feet, formed like ours, in basins in the drift. They tell us as plainly as if written in a book, of the different successive forests which there have lived and flourished, and finally disappeared, and been succeeded by others. The oldest which they reveal is the Scotch Fir, (*pinus sylvestris*), which is not now found in Denmark, and cannot even be domesticated there. Then succeed several varieties of the oak, one after another, and so on, until finally at the last the beech is found, which is still the common forest tree of Denmark, and so it was two thousand years ago, as we learn from written history. How admirably do we here find united into a long chain of history the various links which we see deposited in these beds of peat, the last of which, being united with and interpreted by written history enable us to read all the rest, with almost as much confidence as if the written history extended back to the time when the first layer of peat was deposited. How shall we restrain our impatience till the seal shall be broken to similar volumes of history, which lie profusely scattered all over prairie land, waiting to be opened and read by the discriminating geologist? There we may reasonably hope to find facts which will throw a flood of light on the subject of our present inquiry. There alone may we hope to learn, with a reasonable degree of certainty, what kinds of vegetation have grown on these great plains in the long gone ages of the far distant past.

But the supposition of igneous agency in producing the effect under consideration is not a mere speculation or conjecture. It is an established fact, proved by such evidence as leaves no room for controversy. So that, whatever else may also have contributed to the same result, fire at least has done its share. In almost every year, in some part of the country, whole

forests are consumed by fire. In a majority of instances, no doubt, a new growth of trees takes the place of the old, but such is not always the case. Mr. Daniel Ebersol, of this city, who is a good observer, and of undoubted veracity, informs me that many years ago, on the Vermilion River, a fire occurred, under his own observation, which utterly destroyed, root and branch, an entire hard-wood forest, and that the entire burnt district was directly taken possession of by the herbaceous plants peculiar to the prairies, and that in a very few years it could not be distinguished from the adjoining prairie, except by its greater luxuriance. The testimony of Mr. J. E. Shaw, who has resided upon the prairies of Illinois for more than fifty, and upon his farm, within two miles of Ottawa, for more than forty years, is equally to the point. He assures me that he has known many forest districts entirely burned over and every living thing upon them destroyed. Generally they were replaced with trees similar to the former growth; but that sometimes the prairie herbage takes and maintains possession. He cites an instance on his own farm, where, forty years ago, when he took possession, there was a forest of large trees, which was destroyed by a fire, when a part of the burned district was again covered with trees, and a part was taken possession of by the prairie grass, and in a comparatively short time could not be distinguished from the adjoining prairie. He mentions another occurrence of the same kind, within his own observation, in Putnam county. All who know Mr. Shaw, as I have for a third of a century, will place implicit confidence in the truth of his statements and the accuracy of his observations. Indeed, the character of the latter is such as scarcely to admit of mistake. But corroborating testimony is abundant. I have conversed with many old settlers in different parts of the prairie regions, who mention similar occurrences. I venture the assertion, that a thousand witnesses may be found still living who can state particular instances of the same kind. In my early wanderings over the wild prairies it several times occurred, when approaching a body of timber, that I met in the prairie grass charred remains of forest trees, perhaps half a mile or more from the edge of the wood, and I have in no instance inquired of one who had similar facilities for observation who did not remember having observed the same thing.

In a former part of this paper I have shown, by evidence which may be seen and comprehended at this day by every observer, how prairies have been and are still being converted into forests. I have now stated, with considerable particularity, evidence satisfactorily showing how forests have been converted into prairies. This seems to me of the very essence of the inquiry, which can alone be solved by evidence of authenticated facts, one ounce of which should be entitled to more weight than a pound of ingenious conjecture.

How vain, then, are the most plausible theories and fine-spun speculations, when we have this palpable, tangible proof of the actual process by which the result has been produced, and that by a simple cause adequate to the result. If the thousand witnesses who have observed this process going on before their very eyes had been in the habit of writing and publishing their observations for the last half century, the question would have been long since so conclusively settled, both among the learned and the unlearned, that all men would be surprised that it was ever a subject of dispute. The great danger to truth would have been that too much effect would have been attributed to igneous agency. For myself, while I am prepared to believe that this has been the most potent of all the causes contributing to the result, I am also prepared to admit that there have been many minor auxiliary causes aiding the principal one, which may have escaped the attention of observers. Least of all of these are the facts, which may be considered established as such, and which tend to support what may be termed the shallow pond theory. Those which are invoked in support of what may be termed the arid theory may have had a considerable influence in aid of the prairie fires on what may be termed the fertile prairie, and even the most controlling cause on the desert plains, where both herbs and trees are nearly wanting for the lack of moisture to sustain them, even if once there planted. Where there is not sufficient rainfall to sustain trees when planted, we may reasonably assume that that is the cause of their absence; but I am slow to believe that this, or the peculiar constituents of the soil, is the principal cause where trees grow and flourish vigorously when once introduced. The same cause which keeps them away should kill them when present, if still operating. If there is less annual rainfall in prairie

than in timber districts, we may appreciate that fires, from that cause, may have been more frequent and more destructive, while our daily observation proves that the limited quantity of rains does not render the soil or the atmosphere unadapted to the growth of trees, at least on the prairies east of the Missouri River.

In grouping together some of the facts in support of what may be denominated the igneous theory, I but state a theory which is as old as the first white settlements upon the prairies; but because it has been universally accepted by those who have had the greatest opportunities for observing the facts bearing upon the question, although they make no pretensions to scientific attainments,—for that reason I do not feel called upon to reject it, and with it a great volume of facts which seem to conclusively establish it. At least till some one else shall produce other tangible facts, as well supported by proof as these, in support of some other theory, and tending to prove the fallacy of the conclusions deduced from these, I must believe that the popular opinion of the country is in the main correct.

Perhaps I have too little respect for mere theories, and too much reverence for facts. I cannot be content with general observations of facts without descending to their minute details, which in my view become of immense importance as qualifying or explaining more general observation. If without the careful study of well-established facts, mere theories may be draped in the tinsel glitter of learned speculations, they can never satisfy that wholesome craving for exact knowledge, which alone forms a sure basis for definite conclusions. Science has sometimes suffered grievous wrong from some of her votaries, who have felt called upon to explain everything, whether explicable or not by ascertained facts; and, indeed, the more occult the explanation, the more profound would their learning appear. If it so happen that manifest facts are opposed to their theories, why—so much the worse for the facts!

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